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From guessing to “gissing”: HisGIS analysis for mapping urban transformation and military reuse of suppressed convents in Brussels, Antwerp and Bruges (1773-1860)

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The secularisation of all monastic properties at the end of the 18th century caused a remarkable metamorphosis of urban space in Belgium. Large numbers of monastic complexes, material witnesses of a society entrenched by the Catholic religion for centuries, were erased from the townscape and replaced by new urban fabric. This process, however, was gradual and far from complete. Many former monasteries survived to a certain extent, as they were reused by state and urban institutions (e.g. charities, schools, prisons, hospitals, barracks, etc.) as well as private actors (industries and housing). Taking the case of military reuse as an example, this article describes how this transformation process can be mapped using historical GIS.

Introduction

Historical GIS, or HisGIS, is the application of geographic information science in the field of history. Although this marriage between GIS and history has sometimes been received with scepticism,[1] a large and growing number of studies in the field of urban history have shown its value: most importantly, HisGIS is able to *map* historical sources, thereby adding a hitherto neglected geographical dimension to historical explanations.[2] Furthermore, HisGIS makes it possible to use location as a central means of collecting, storing and combining a wide range of historical sources.[3] In this contribution, the design and application of HisGIS are described for a problem at the interface of urban history, architectural history, and historical geography: the urban transformation that occurred after the suppression of convents in the late 18th-century Belgian cities.

From the late 18th century, Enlightenment ideas disseminated by the Austrian (1773-1794) and French rulers (1794-1815) throughout current-day Belgium transformed the relationship between church and state.[4] Eventually, between 1773 and 1796, a series of decrees suppressed all religious houses, not only sending shockwaves through society but also triggering urban reconfiguration: former religious houses were converted to receive profane functions or, more often, they were partially or totally demolished to give way to new urban tissue. Given the large number of convents, which could take up no less than one seventh of the towns' overall surface, their post-suppression development should be considered as a major factor in explaining late 18th- and early 19th-century urban development.

The study at hand aims to describe, visualise and explain the material urban transformation after the suppression of the convents.[5] It departs from the monographic approach, which scrutinises only one or a few convents, and instead explores mechanisms of transformation by including a large number of cases and applying an interurban comparative approach. A HisGIS is likely to suit the needs for such a multidisciplinary and comparative approach. Its practical application, however, evokes many questions: (1) How to position

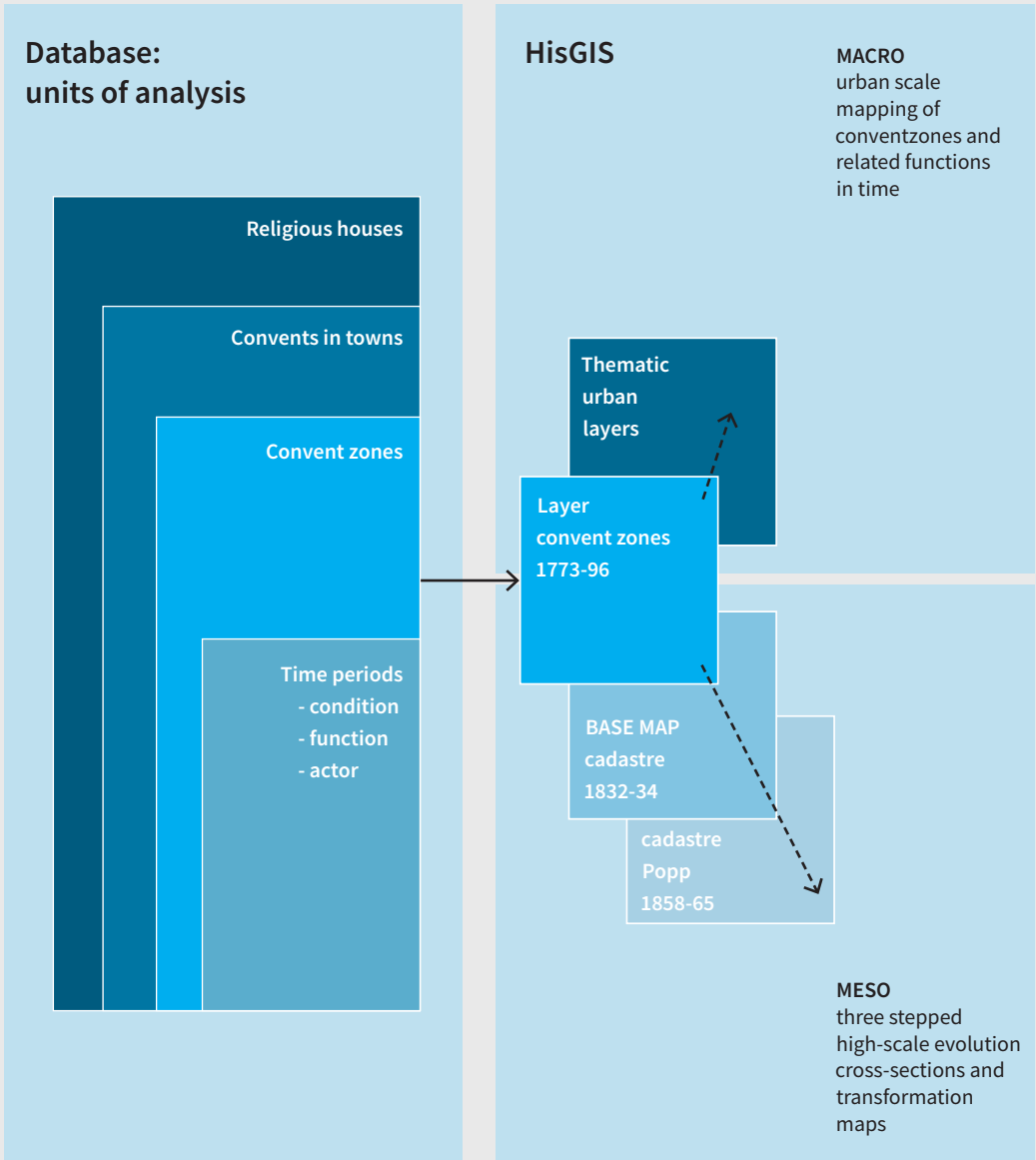

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FIGURE 1
Scheme: methodological framework (drawing by R. Klaarenbeek).

the HisGIS in the overall research strategy? (2) How to define meaningful and comparative research units? (3) How to handle temporal aspects, both in data gathering and in mapping? (4) How to retain integrity and deal with inequality with regard to the historical sources? After having discussed the overall methodologic framework, we will focus on the case of the reuse of former convents for military purposes.

Methodologic framework

This study focuses on three major Belgian towns, namely: Brussels, Antwerp and Bruges. Preceding the urban extensions that would follow in the late 19th century,[6] their 18th- and 19th-century layout was still confined by the late medieval town walls. Within these towns, a group of hundred convents was identified. This sample was subjected to an analysis at three-levels. At the micro-level of the buildings, an in-depth study was conducted for seven representative cases. A comprehensive archival research allowed for analysis of architectural interventions at the level of the selected monastic buildings. At the meso-level of the neighbourhood, the analysis moves away from the idiosyncratic micro-level. A selection of cartographic sources allowed for the reconstruction of the convents and traced their evolution in the neighbourhoods. The macro-level, the level of the town, entails a positioning of the convents on the level of urban networks. The analysis of these three levels all to a different degree used the HisGIS.

HisGIS structure

Every HisGIS requires, for the matter of topographic coherence, a historical, topographical reference map to which all other layers adjust, referred to as the "base map". The base map for this study is the modern cadastre, which was initiated by French rulers from 1811. Very much in line with the middle part of their famous credo *liberté, égalité, fraternité*, the modern cadastre aimed to create a fair and uniform system for land tax.[7] The massive enterprise of surveying, recording and evaluating an entire country had survived two regimes when it was finally completed in the young Belgian Kingdom in 1834. The cadastral maps surpassed their *ancien régime* predecessors by far, providing the research with a "complete", detailed and highly comparative base map that used the uniformed metric system. Importing the cadastral maps in HisGIS is usually a time-consuming exercise that comprises scanning, "geo-referencing" and vectorising. This effort could, however, partly be avoided by using georeferenced or even vectorised plans of existing infrastructure projects.[8]

The base map was complemented by a series of layers (FIG. 1). At the macro-level, the layers were formed by distracting the locations of main roads, main waterways, town walls and gates and urban nodes from historical maps. These layers enable us to relate convents and their development

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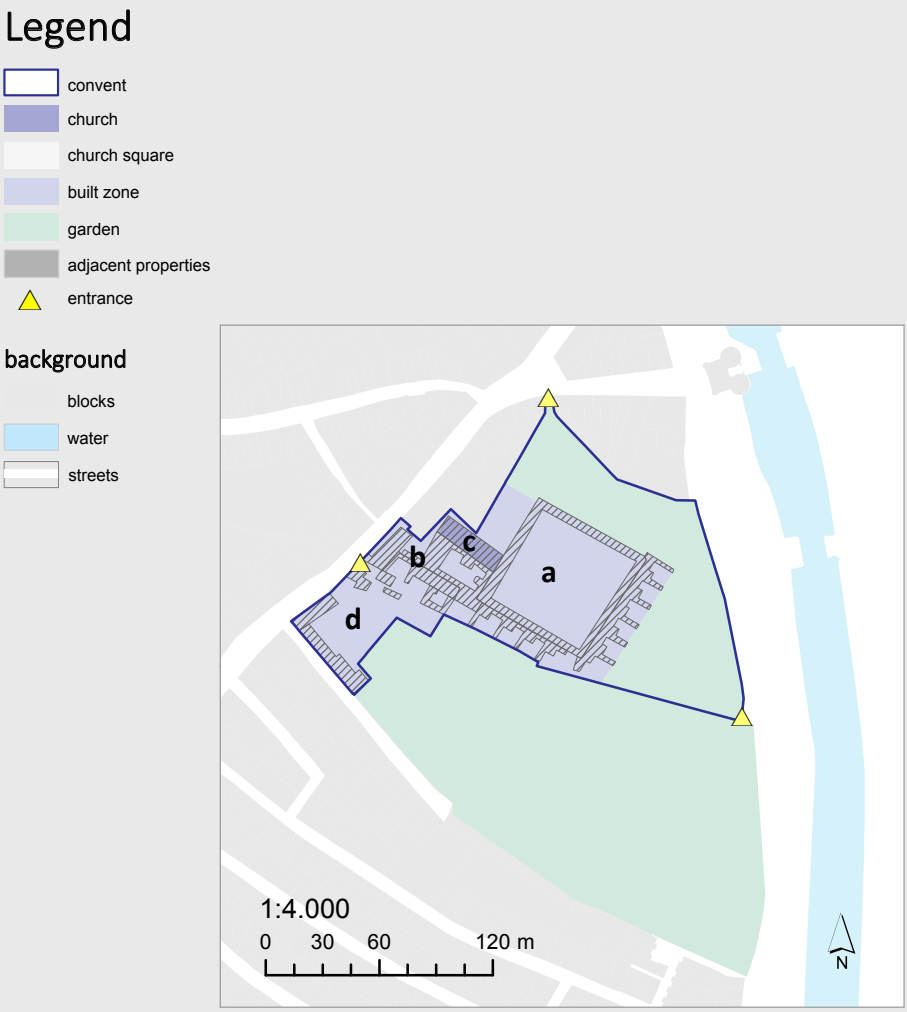

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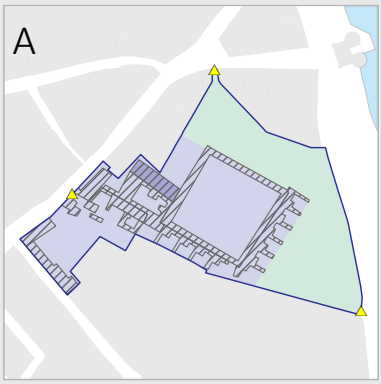
FIGURE 2
Charterhouse in Bruges.
Reconstruction (above), cross-sections (A, 1783; B, 1832; C, 1865; middle) and transformation maps (AB and BC; bottom) (maps by R. Klaarenbeek).

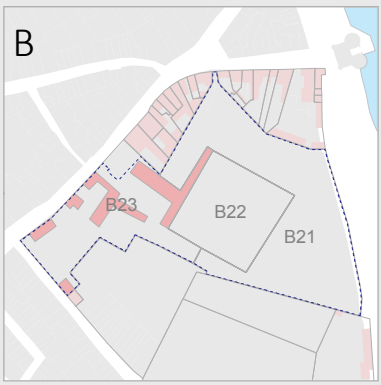
a
Claustrum major: large cloister gallery with small individual houses, which facilitated the strict isolation according to the eremite tradition.

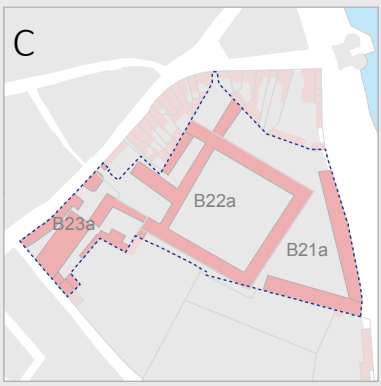
b
Claustrum minor: small cloister with communal functions of refectory and chapterhouse.

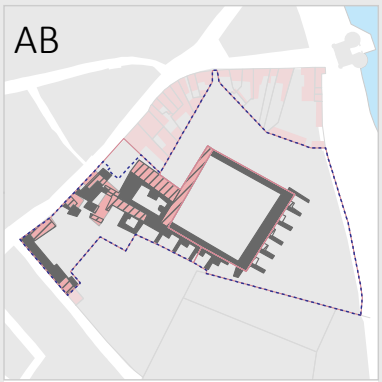
c
Baroque church.

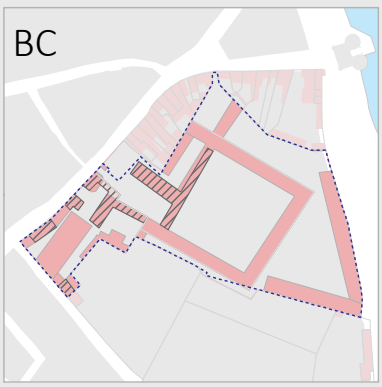
d
Parlours, visitor rooms, brewery and other profane functions.











small maps: A, B, C, AB and BC:
Scale 1:4.000

former convent
buildings (for AB and BC: new buildings)
existing buildings
demolished buildings

(see spatial-temporal database, below) to structural elements in the urban fabric. At the meso-level, a sequence of three high-scale cross-sections was applied: (A) vectorised ground plans of the former convents in 1773-1796; (B) the original cadastral maps, from 1832-1834 (base map), and (C) cadastral maps by J.C. Popp around 1858-1865 (FIG. 2).[9] By comparing one cross-section with the preceding one, the evolution of the parcels and buildings could be explored. To enhance the legibility, pairs of subsequent cross-sections were combined into a single "transformation map". These maps visualise demolitions, new buildings and continuity of built surface between two phases (A>B and B>C), at a single glance.

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Comparisons of the maps that originate in different times and different cities needed to be done cautiously. Overall, the sources allowed for a fairly equal distribution of the cross-sections over the researched period. However, as a result of varying moments of suppression and the availability of cadastral maps, the timespan A>B and B>C could fluctuate among convents. Furthermore, caution was needed with regard to the sources. While layers B and C were based on uniform and highly comparable cadastral plans, we should bear in mind that the sources that formed the foundation of layer A comprise a heterogeneous cartographical and iconographical body. In fact, the degree of inference and reliability of reconstructions varied from one convent to the other, as will be elaborated below.

Convent-reconstructions

Of crucial importance in the HisGIS were the reconstructions of the ground plans: the delineations of the surface and the buildings of the convent. These reconstructions can be considered a sort of "zero-measurement", reflecting the convent before alterations for new functions. With regard to the sources; there was no uniform cadastre at hand in the late 18th-century and town plans generally employed too small a scale for a detailed analysis. Therefore, the cartographic evidence that was generated for countries or towns had to be left aside in favour of the more specific plans and drawings of individual convents. Unfortunately, such plans were not available for every convent; the technique of retrogressive mapping was applied to obtain a good idea of these monastic complexes. Based on the (best) sources available, the reconstructions can be grouped in four categories with a decreasing degree of reliability:

1. **Sales plans** (66 %). A considerable number of the secularised convents was displayed for sale shortly after their suppression in the late 18th or first decennium of the 19th century. To evaluate properties of the convents, estimate prices and inform future buyers, governments appointed architects and surveyors to draw ground plans of the convents (FIG. 3). These plans, which usually came with a comprehensive legend, offer an exceptional

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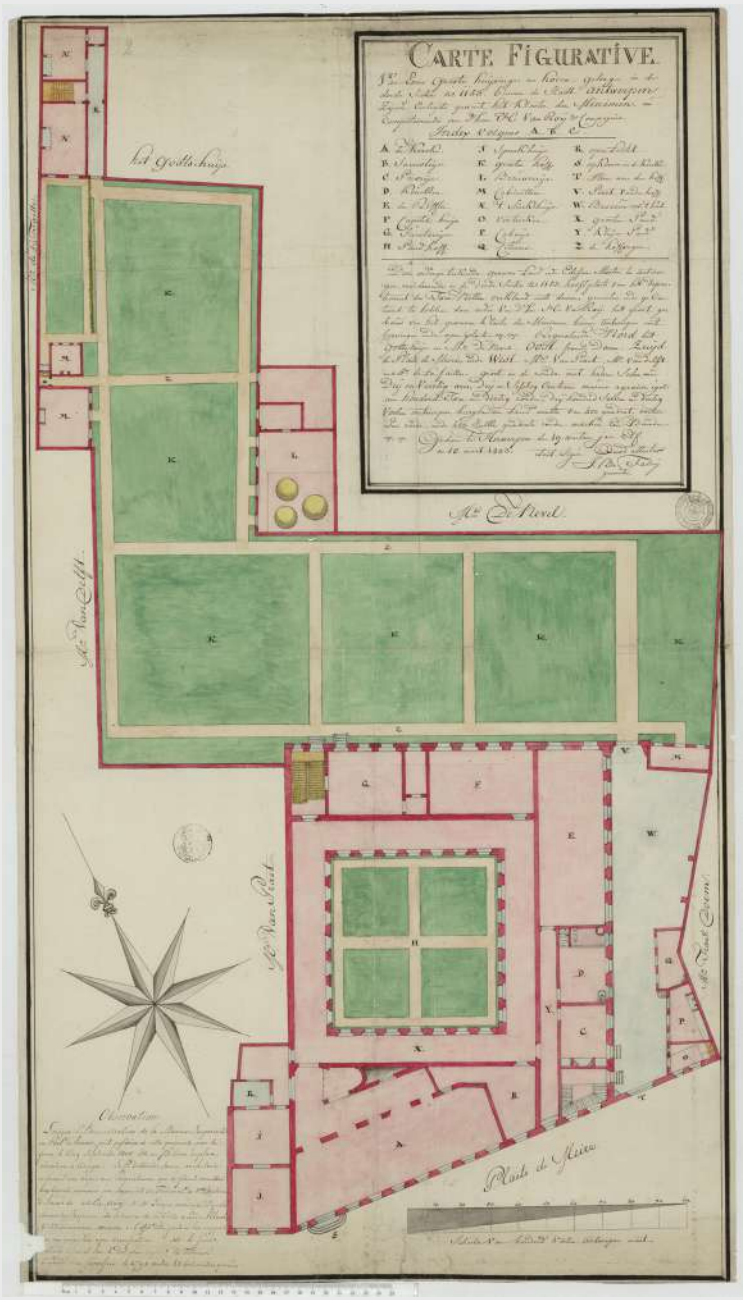

FIGURE 3
Minimes friars convent in Antwerp, 1803 (Municipal Archives Antwerp, Topographical Atlas, 12#4192). Large scale sales plans offer an exceptional insight into the convents' spatial organisation.

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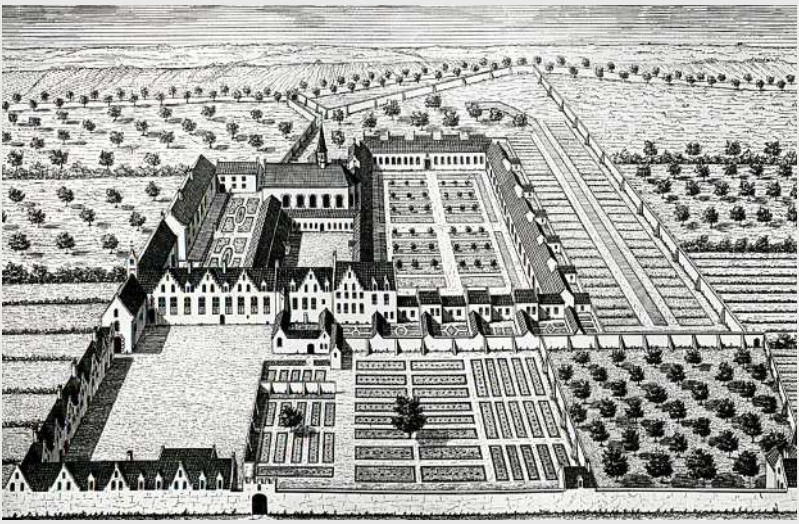

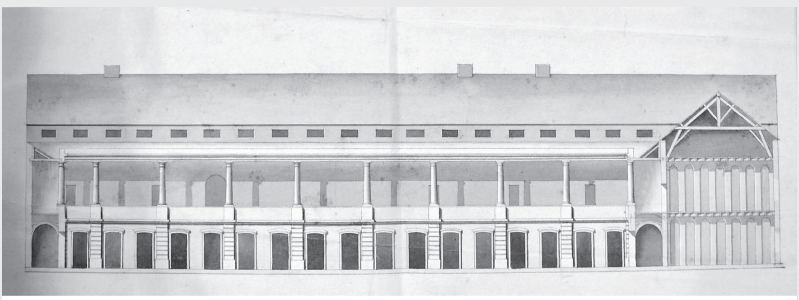

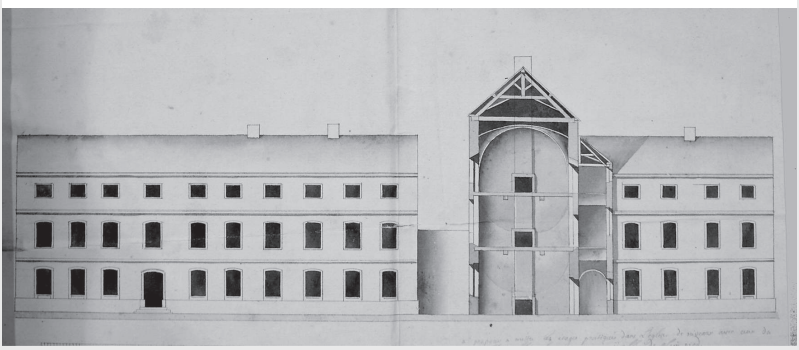

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FIGURE 4

Bird-eye view of the Charterhouse in Bruges, a copy of Sanderus' image in *Flandria Illustrata* (anonymous, *Maison de l'Ordre des Chartreux: Vues et Notices*, volume 2, item 8, p. 197). Remarkably, as a result of omitting the urban context, a rural convent is falsely suggested.

FIGURE 5

Frontal view of the north and west wing of the projected barracks on the site of the Charterhouse in Bruges, 1789 (Municipal Archives Bruges, Old Archives, 289). New barrack wings were skillfully integrated with the existing convent architecture. The new architecture had a distinctive neoclassical appearance.

insight into the convents' spatial organisation. Although the beauty of these coloured plans might in some cases not seem to be in line with archival sources that speak of considerable degradation after suppression caused by plundering,[10] the sales plans are generally supposed to provide a reliable images of the convents. Additionally, for Brussels, the exceptional town plan of d'Archambault reaches the level of detail of sales plans and is entitled to fall in this category.[11]

2. **Bird-eye views** (10 %). Some convents were depicted on so-called bird-eye views: gravures from a real or an imagined high standing point, overviewing the convent as a whole, often with a legend specifying its main functions (FIG. 4). Applying a 17th-century source to represent the situation at the end of the 18th century, is considered suitable since most urban convents were to a large extent finalised by then. Confronting the bird-eye views with the cadastral plans helps us to determine the reliability of the bird-eye views. In addition, the various three-dimensional buildings had to be converted to the flat surface and rectified for potential perspective distortions.
3. **Retrogressive mapping, rich cadastral information** (18%). When individual sales plans or bird-eye views are lacking, the early cadastral map (1832-1834) was the main source at our disposal. The cadastral map clearly depicts the church and the convent when not demolished. Since no better sources were available, these buildings on the cadastral maps were projected back in time, a method that is called "retrogressive mapping". Furthermore, large size parcels were often instructive in delineating the convent area. However, bridging a period of ca. 34 up until 47 years has the drawback of a decreasing reliability compared with the abovementioned sources. This is especially true for additional buildings, delineation of the borders of gardens, the convent as a whole, and the entrances.
4. **Retrogressive mapping, poor cadastral information** (6%). When the convent had been demolished, even the cadastral situation does not give direct indications about its layout. However, the cadastral information often offers more indirect indications: both the boundaries of the parcels and the registers are in general very instructive in delineating the surfaces of demolished churches, convents, and gardens. Furthermore, irregularities in parcel boundaries facing the street can hint at entrance buildings. Finally, iconographic sources such as drawings, paintings, and photographs (from the 1850s) can help positioning the buildings.

   To properly assess the aggregated character of convents, a layer "convent clusters" was created. Monastic architecture is characterised by its composition of functional clusters accommodating communal life dedicated to God. The actual configuration of these clusters relied on many factors – such as the century in which it was built, the apostolate, the gender and site-specific

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topography – resulting in very different urban outcomes.[12] The most basic functional clusters, however, were shared by all convents. Within the layer "convent zones" polygons are drawn that represent: (1) church, (2) convent, and (3) gardens. In addition, depending on the sources, (4) adjacent rented houses, (5) adjacent rented gardens, and (6) church squares could be defined. Since these functional clusters set the basic conditions for post-suppression adaptions, this layer offers a crucial refining of the cartographic analysis.

A spatial-temporal database

The morphologic cartographic aspect dealt with so far was complemented by a functional analysis through the use of a spatial temporal database. The input for the spatial temporal database could derive from a wide range of archival material. Since a full archival research for all convents of the sample (100) was not feasible, four sources were selected: (1) textual information on town plans; (2) works by 19th-century urban historians; (3) owner registers from the original cadastre (1832–1834) and the Popp-maps (1856–1865); (4) heritage repositories, if available. Unavoidably, the availability and quality of the sources diverged, to a certain extent, between towns and convents. Whereas information about the large former convents which were state property was plentiful, some smaller convents that passed into private hands were less well documented. Additionally, with the progressing of time, the documentation increased.

The database provides a (hierarchical) structure that allows information to be recorded on the most appropriate level. This structure comprised larger and smaller elements: religious houses, urban convents and convent zones (FIG. 1). The last, the level of the convent zones, served for recording the functional development. Each convent zone (church, convent, gardens) was attributed a single or, more usually a number of "periods" – which were confined by a begin and an end year – to form a closed timeline. Next, every period was coded on three elements: (a) urban condition (reused, demolished, new buildings or fragmented); (b) function in seven main categories (military, government, convent, parish church, private industry, municipal charity and fragmentation); (c) urban actors (state, municipality, private individuals and religious). The resulting database allows formulating queries, which are both fine-grained and "mappable" through corresponding ID's the convent zones layer.

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Transferring historical information into a database logic can imply a loss of historical complexity. Some cases did not easily fit into one of the predefined categories. Only a deliberate, consistent processing combined with fields for open remarks and reference could safeguard a maximum degree of transparency and reducibility. Furthermore, lack of information resulted in gaps of time periods. While some of these gaps cannot be prevented

and must be processed as such, other gaps can be complemented by "educated guesses". An example of such "educate guessing" could be the presumption of continuity in state ownership (actor) in a period that is both preceded and followed by state ownership. Obviously, this kind of presumptions is registered.

Military reuse

The second part of this paper presents a further exploration of the methodology by assessing the particular case of military reuse. Reuse by the army, as the database indicates, has the highest proportion and frequency of convent reuses. This finding can be related to the highly unstable late 18th and early 19th-century geo-political situation of the region. Indeed, in the period preceding Belgian independence in 1830, the territory belonged to the Austrian Empire (1730–1793), the French Republic and Empire (1794–1815), and the United Kingdom of the Netherlands (1815–1830).[13] Consequently, defence was of utmost priority and the key towns permanently hosted army corps. Given the uncomfortable situation of accommodating these troops in civilian houses, the availability of urban convents provided a good alternative. Convents were thus transformed into barracks, cavalry stables, military hospitals, arsenals, etc.

In exploring the military reuse, the previously proposed three-level approach will be applied. The micro-analysis will focus on the former Charterhouse in Bruges. This convent is a rare example of a reused convent by the army that is still present in the current town. Moreover, it is characterised by a long military reuse, and several interesting plans are at hand. At the meso-level, making use of the transformation maps, the morphologic development of the Charterhouse in Bruges is compared with other army reused convents. At the macro-level, finally, the military reuses are situated in a broader time-space frame.

Micro-level: Caserne dit les Chartreux

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The *Chartreuse Val-de-Grâce* was built from 1610 within the Bruges town walls, in the close vicinity of the Kruispoort. A bird-eye view (FIG. 4) and an 18th-century survey allow reconstructing the monastic ground plan.[14] The general layout is characterised by the distinctive Carthusian architecture organised around two cloisters, the *claustrum major* and the *claustrum minor* (FIG. 2).[15] The former comprised a large cloister with galleries and small individual houses, which facilitated the strict isolation according to the eremite tradition (a on fig. 2). The latter formed a smaller courtyard with communal functions of refectory and chapterhouse (b). The baroque church (c) connected both elements. Parlours, visitor rooms, a brewery and other profane functions were located in the courts along the side street (d). After its suppression in 1783, the complex was ceded to the army.

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A remarkable but never realised plan from 1789 envisioned a conversion of the former Charterhouse into a military barrack.[16] In essence, the design proposed two new barrack wings that were skilfully integrated with the existing convent architecture. The wings were projected on the west and north of the *claustrum major*, thereby continuing the use of the cloister gallery as the central means of distribution. An elevation shows the projected north wing, a two stories high building with an attic under a saddle roof p. 372 (FIG. 5). Every pair of bays of the gallery, extended to the ground to form entrances, was separated by a blocked pilaster. On top of it was an open gallery with parapet and Tuscan columns, which gave entrance to the soldiers' dormitories on the upper floor. The west wing was attached to the church, which was divided into three levels. The dormitories in the former church were accessed from the adjacent gallery of the *claustrum minor* along its long (south) side, which was provided with an additional level as well. In 1834, the former Charterhouse was appointed to permanently accommodate a cavalry regiment, including 300 horses and 300 men.[17] The years preceding 1834 had seen a demolition of many parts of the original Charterhouse: the individual monk cells and the small cloister galleries disappeared for the greatest part, as well as the large cloister galleries, p. 368 except for the west wing (FIG. 2, AB). The preserved church and west wing gallery were integrated into the main, three-story high edifice, as is depicted p. 377 on the ground plan from 1888 (FIG. 6). By opening entrances in the apse, three levels of the church were connected with the main buildings' central staircase, located directly behind the church. The location of the main stables followed the layout of the large cloister and reused existing foundations. In the years that followed, the cavalry complex was progressively expanded to include a riding school and additional buildings for horses, lads, riders, and officers.

Meso-level: military reuse

The morphological development of the Charterhouse from Bruges can, with the help of transformation maps, be compared to other army used convents in Belgian towns. Army reuse, as these maps show, was likely to preserve the (large) scale of the complexes and to prevent fragmentation p. 378, 380 (FIGS 7 AND 8). This may to a large extent be explained by the enclosure and seclusion that were characteristics of both convent and barrack architecture. Former urban convent sites not only separated the troops from civilians but also concentrated army functions in an efficient and economical way. One of the major differences in the use of these buildings after their conversion was their capacity: while convent buildings were used by communities of usually 20 to 35 religious men or women, a number of soldiers that needed to be housed in the complexes could rise over 300.

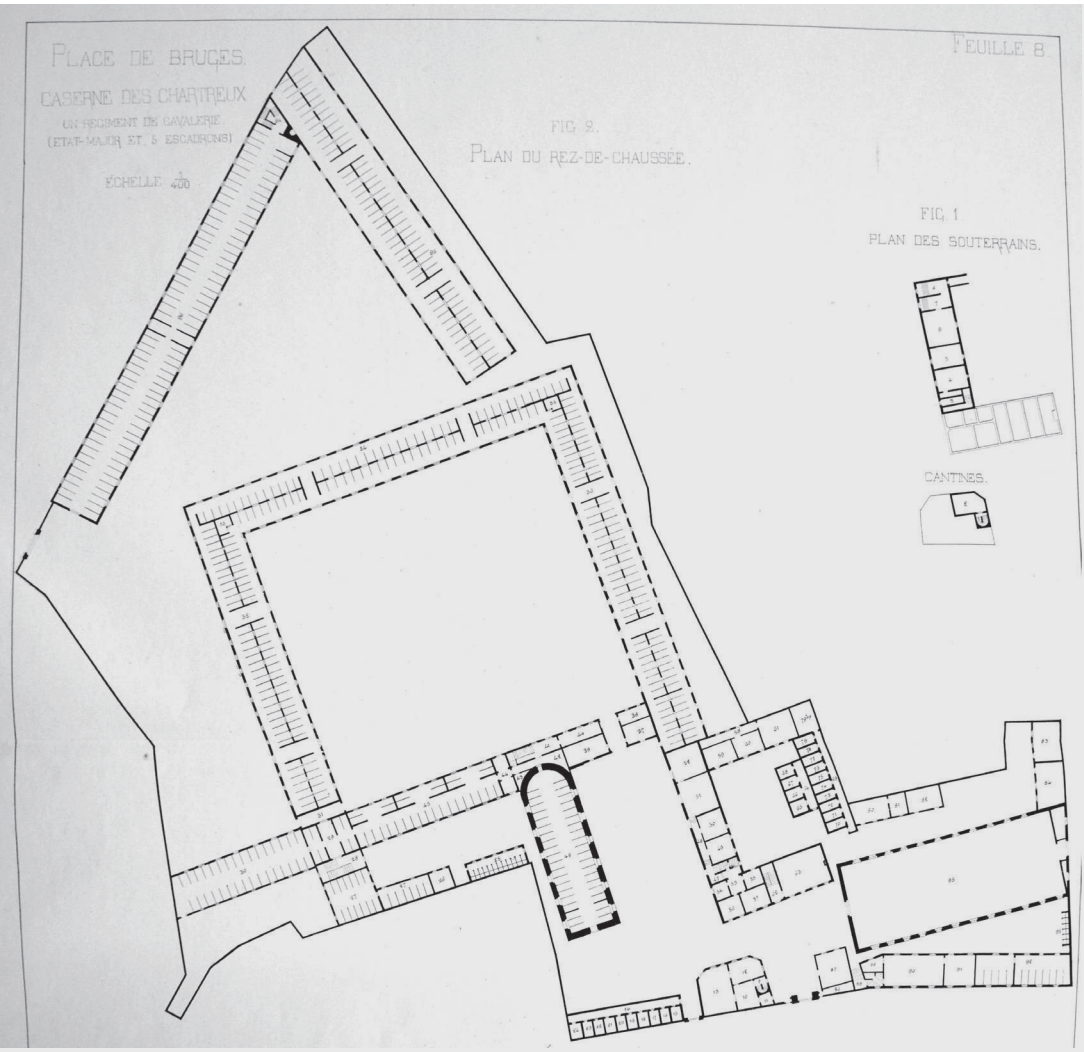

FIGURE 6

Ground plan of the "Carthusian barracks", 1888 (Royal Military Museum, Collection Maps and Plans, 1, *Atlas Bâtiments Militaires*, sheet 8).

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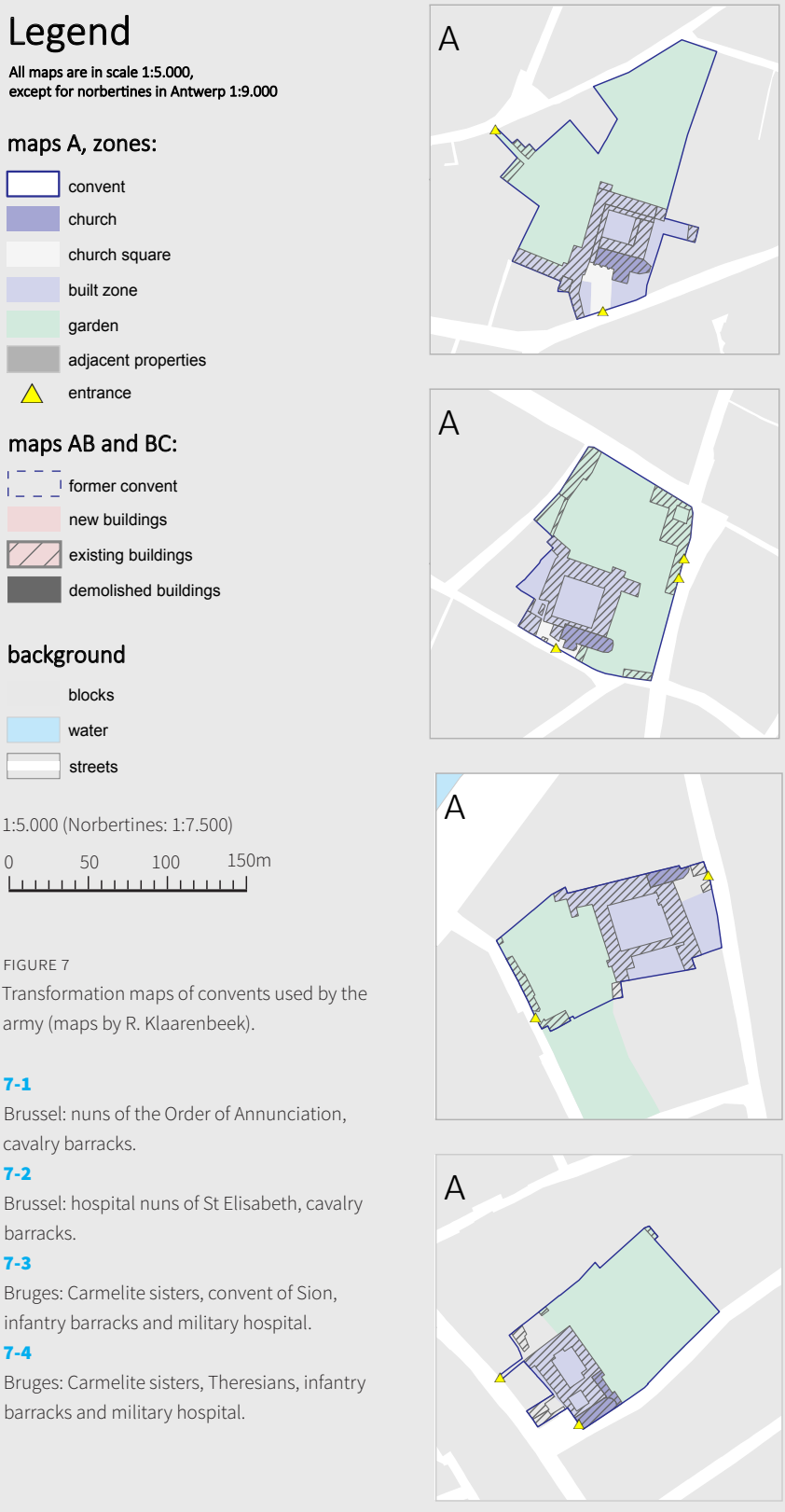

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FIGURE 7

Transformation maps of convents used by the army (maps by R. Klaarenbeek).

7-1

Brussel: nuns of the Order of Annunciation, cavalry barracks.

7-2

Brussel: hospital nuns of St Elisabeth, cavalry barracks.

7-3

Bruges: Carmelite sisters, convent of Sion, infantry barracks and military hospital.

7-4

Bruges: Carmelite sisters, Theresians, infantry barracks and military hospital.

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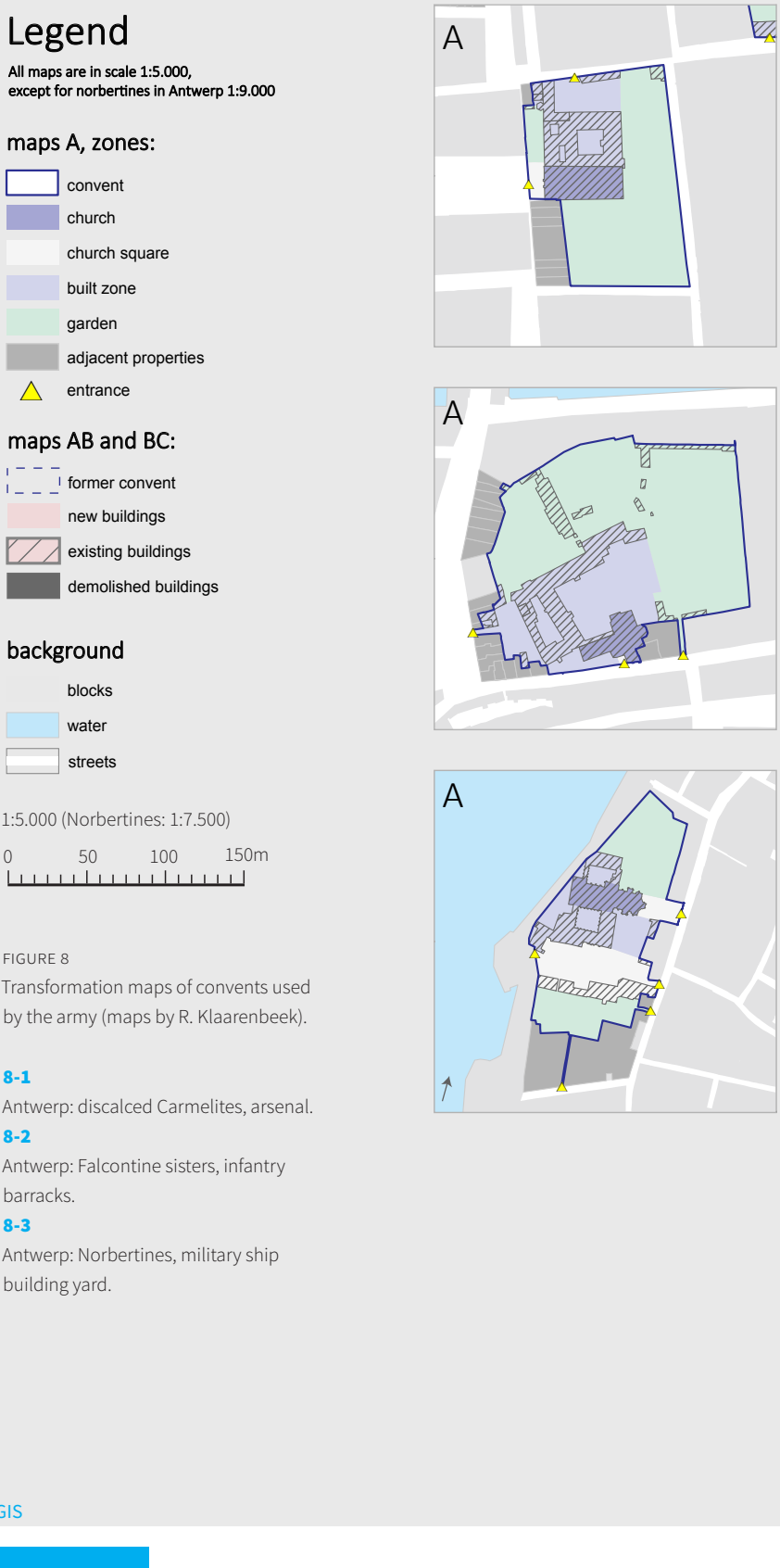

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FIGURE 8

Transformation maps of convents used by the army (maps by R. Klaarenbeek).

8-1

Antwerp: discalced Carmelites, arsenal.

8-2

Antwerp: Falcontine sisters, infantry barracks.

8-3

Antwerp: Norbertines, military ship building yard.

AB
BC
AB
BC
AB
BC
N

Preservation of the scale of former Belgian convents and demands related to the capacity of their new military use often implied the preservation of the large open spaces of the monastic complexes. Indeed, gardens were transformed into courts and served as valuable assets that were used for manoeuvres, preparation, and in the case of cavalries, the packing and saddling of horses. Furthermore, former convent gardens provided the space for new buildings (FIG. 7 AND 8). Whereas infantry barracks show little building activities, cavalries and arsenals were expanded by stables, workhouses, and sheds. Such new constructions were typically constructed alongside the outer limits of the convents and oriented towards the inner courtyard. As such, the positioning of the new constructions materialised the convent borders and reinforced the complexes' seclusive character, despite the radical change in function of the buildings.

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The army's search for economical solutions resulted in preservation, at least temporary, of most convent buildings that were reused for military purposes. Courtyards and long convent wings allowed for a rational organisation and could be adapted to serve specific army corps, such as cavalry, infantry, artillery and logistics (arsenal). Furthermore, the buildings facilitated social differentiation between troops and lower and higher ranked officers. Often these adaptations resulted in an upscaling of room sizes: the demolition of walls of for example the monk cells to create communal soldiers dormitories. Interestingly, similar to the case of the Charterhouse in Bruges, the new "Falcontines barracks" in Antwerp were built on the foundations of the former convent. This implied not only a practical use of the foundations but also a continuation of the usefulness of the organisational arrangement around a central court.

Monastic churches were also integrated into military complexes that were housed in former convents. Often, capacity densification implied the division of the high church's spaces into three or four levels of usable surface. Depending on the specific function, the ground floors of these former churches were used for stables or ateliers, whereas the upper level usually served as soldiers' dorms or warehouses. The choice of material in these constructions and the management of the vertical circulation by building staircases show a broad range of solutions that were related to the church at stake. These church adaptations are often relatively well documented and offer a sample-card of how cubic meters of sacred space were turned into a maximum of square meters to be used by the military.

Macro-level: chronology and locations

The nominations of the convents preceded any urban or architectural interventions. Precise locational motivations in the process of reuse differed from one army feature to another and were part of an intricate process of

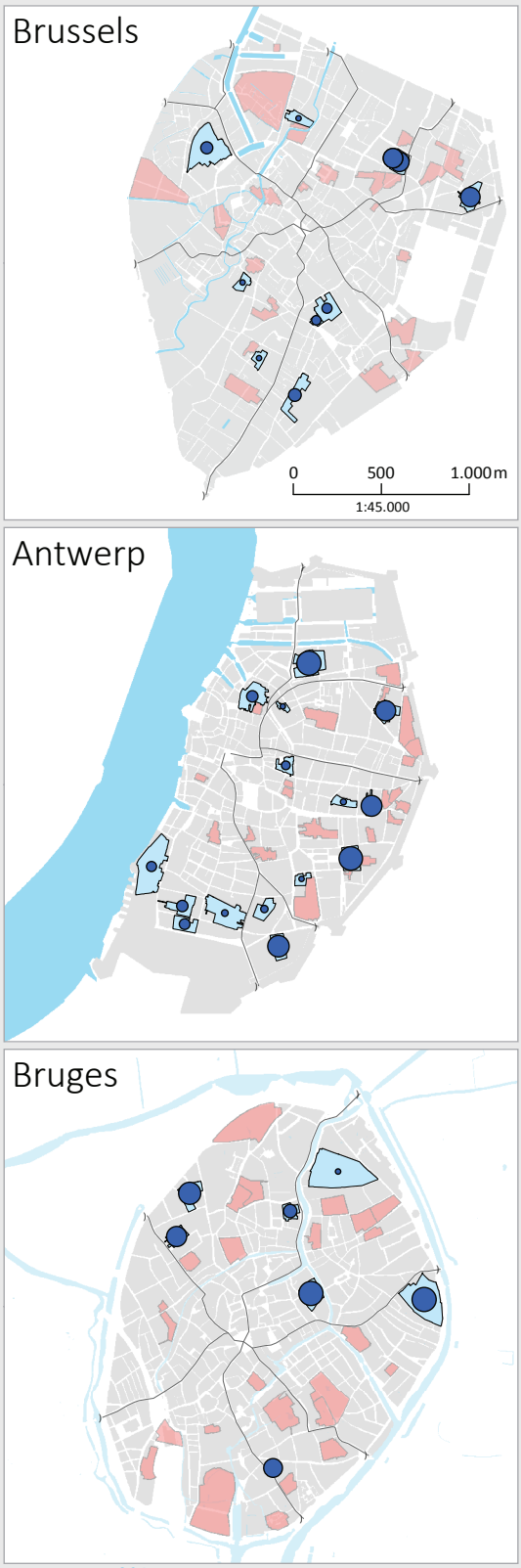
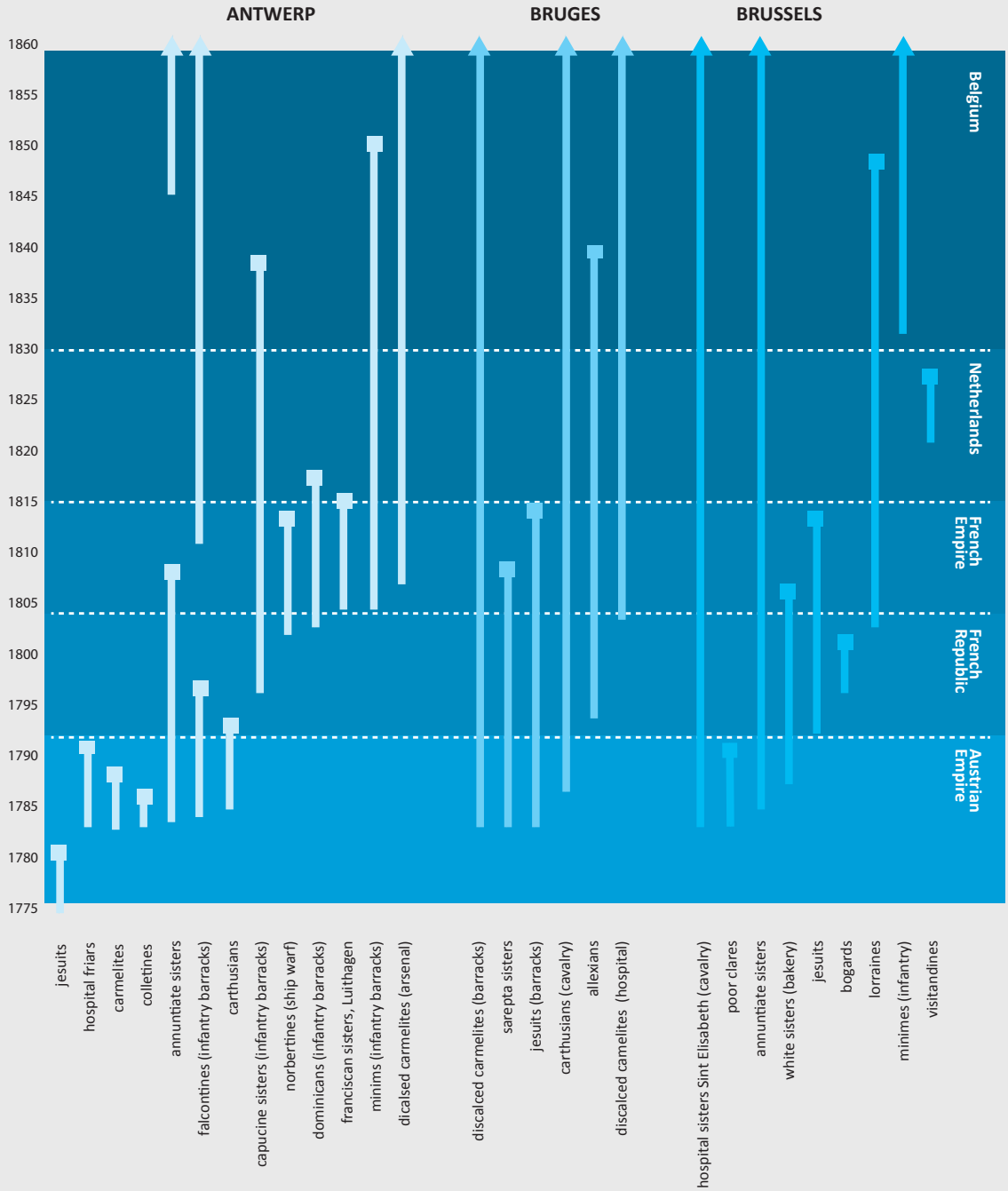


FIGURE 9 p. 385
Urban maps: duration of military functions (maps by R. Klaarenbeek).



p. 385

FIGURE 10

Scheme: chronology of the military function in three cities (maps by R. Klaarenbeek).

decision making. By mapping the convents with an army function, however, some general locational aspects can be deducted (FIG. 9). The maps reveal a clear preference for locations in the periphery rather than the centre of the Belgian towns. This finding corresponds to the (cavalry) troops' needs to manoeuvre outside the town, without the need for crossing the town. More locally specific aspects include the temporary "marine cluster" in the south-west of Antwerp, as well as an inclination to locate army facilities to the eastern part of Brussels, in the vicinity of the administrative and royal quarters. Additional research in correspondences between actors such as the ministry of defence and the town administrations can reveal direct motivations and enrich the analysis with specific and local considerations. The year of attribution of army functions and the duration of military use are indicated in a graph which is based on the database (FIG. 10). The graph only includes convents that were used by the army for substantial periods, longer than three years. The graph shows that there has been a sharp decline of army conversions from the Dutch era (1815–1830) onwards. This decline can be explained by the reduction of available convents of the domains in this period, as they were increasingly sold or equipped to fulfil other uses.[18] The wave of convent conversions in Antwerp during the French Empire already required reselling of properties of private individuals on a great scale. Only a unyielding hand, Napoleon himself, gave the orders and urgency – Antwerp's prime importance as a marine basis, the "gun pointed to England"[19] – seems to have made this possible. Furthermore, as the 19th century progressed, a new architecture was progressively preferred for reuse. [20]

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p. 384

Conclusion

This study set out to construct a HisGIS in order to describe, visualise and explain urban transformation in three Belgian towns after the suppression of convents. Three levels of analysis allowed us to make optimal use of the available sources and to provide insights on different scales of transformation; at micro-, meso- and macro-level. The selection of the most appropriate sources was of crucial importance in fulfilling the comparative aim. The modern cadastre (1832–1834) – radiating both forward (Popp, 1858–1865) and backwards (retrogressive analysis) in time – provided the study with a highly comparable body of cartography, allowing for high-scale reconstructions. With regard to the functional analysis, a combination of written and archival sources, allowed to reconstruct functions on a detailed level.
Despite its exploratory nature, the cases of military reuse offer insight into the results this method may yield. By the elaboration of (projected) constructions at the site of the Charterhouse in Bruges, the richness of the sources and materials at the micro-level was demonstrated. A key strength

of the present study lies in the HisGIS for urban-comparative research at the meso-level, as it allowed to compare the morphological evolution of the army reused convents in three towns. At the macro-level, finally, the mapping yielded relations between location and functional or urban development. The transformation of quiet places of worship into noisy, smelly and lively places of the barracks, was accompanied by a remarkable continuity in the morphology of the former convent complexes.

Notes

1 Sam Griffiths, "GIS and Research Into Historical 'Spaces of Practice': Overcoming the Epistemological Barriers," in *History and GIS. Epistemologies, Considerations and Reflections*, ed. Alexander von Lünen et al. (Dordrecht: Springer, 2013), 153-171.

2 To name just a couple: Boris Bove, Hélène Noizet, and Laurent Costa, eds., *Paris, de Parcelles En Pixels. Analyse Géomatique de L'espace Parisien Médiéval et Modern* (Paris: Presses Universitaires de Vincennes et Comité d'Histoire de la Ville de Paris, 2013); Paulo Pinho and Vitor Oliveira, "Cartographic Analysis in Urban Morphology, " *Environment and Planning B: Planning and Design* 36/1 (2009): 107-127; Garry Keyes and Jens Toftgaard Jensen, "Mapping Urban History: GIS and the Analysis of the Urban Space of Nineteenth-Century Aarhus," International Association for History and Computing XVth Conference in Tromso, 2003, available at: http://www.rhd.uit.no/ahc/paper/jtj_gk_mapping_urban_history.pdf.

3 Anne Kelly Knowles and Amy Hillier, eds., *Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship* (Redlands, Calif.: ESRI Press, 2008).

4 Gratianus De Schepper, "Marie Thérèse et Joseph II: leur politique à l'égard des maisons réligieuses dans les Pays-Bas," *Revue d'Histoire ecclésiasque* XXXV (1939): 509-529.

5 The article is part of the ongoing research project *Redeveloping the City: urban transformation and 'heritigization' after the secularization of religious houses in Belgian towns at the dawn of the modern age (1773/1796-1860)*, which is financed by the Research Foundation – Flanders (FWO, G.0B0912N). The promotors of this project are: Prof. Thomas Coomans (KU Leuven, department Architecture), Prof. Jan De Maeyer (KU Leuven, KADOC), Prof. Inge Bertels (Vrije Universiteit Brussel), and Prof. Tom Verschaffel (KU Leuven, KULAK). See for an introduction: Thomas Coomans and Reinout Klaarenbeek, "De Ruimtelijke Metamorfose van Steden Na de Secularisatie van de Kloosters in België Vanaf 1773 Tot 1860," *Stadsgeschiedenis* 9/2 (2014): 149-165.

6 Yves Segers, "Een Omstreden Verbruiksbelasting: De Stedelijke Octrooien in Belgie (1799-1860)," *Belgisch Tijdschrift Voor Nieuwste Geschiedenis* 30/3-4 (2000): 325-369.

7 Juul Verhelst, *De documenten uit de ontstaansperiode van het moderne kadaster en van de grondbelasting 1790-1835, Door J. Verhelst*, Miscellanea archivistica 31 (Brussel: Algemeen rijksarchief, 1982); Antoine Zoete, *De documenten in omloop bij het Belgisch kadaster 1835-1975*, Miscellanea Archivistica 21 (Brussel: Algemeen

rijksarchief, 1979); Roger J. P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Property Mapping* (Chicago: University of Chicago press, 1992).

8 "GIStorical Antwerp", https://www.uantwerpen.be/en/projects/gistorical-antwerp, see: Ellen Janssens and Iason Jongepier, "GIStorical Antwerp : Historisch GIS Als Laboratorium Voor de Stadsgeschiedenis," *Stadsgeschiedenis* 10/1 (2015): 49-62. "Kaart en Huis" in Brugge, www.kaartenhuis.be, see: Jan D'hondt, ed., *Huizenonderzoek & Stadsgeschiedenis. Handelingen van het Colloquium,* Leven in Oude Huizen, VII (Brugge: Levend Archief VZW, 2009). In Brussels our gratitude goes to the DMS, monuments and sites directorate, providing this study with vectorised cadastral maps.

9 Juul Hannes, "L'atlas cadastral parcellaire de la Belgique de P.-C. Popp: importance de cette source pour la géographie historique des communes," *Bulletin trimestriel du Credit Communal de Belgique* 85 (1968): 137-146 (RUGSeminaries voor de geschiedenis, 1968); Wouter Ronsijn, *De kadasterkaarten van Popp, een sleutel tot uw lokale geschiedenis: historische geografie van Aarschot, Asse, Halle en Tienen aan de hand van de kadasterkaarten van Popp*, Accenten uit de geschiedenis van Vlaams-Brabant (Leuven: Peeters, 2007).

10 François Antoine, "La vente des biens nationaux à la fin du XVIII[e] siècle, nouvelle donne pour la ville," *Articulo*, special issue 1 (2009). Accessed March, 30, 2017, https://articulo.revues.org/1015.

11 Lisette Danckaert, "Plan Détaillé de La Ville de Bruxelles Par Pierre Lefebvre d'Archambault," *Cahiers Bruxellois* XIV (1969): 85-90.

12 Thomas Coomans, "L'ordre autour du cloître: l'architecture des abbeys et des couvents, entre tradition, réformes et réaffectations," in *Des couvents en héritage, sous la direction de Luc Noppen, Thomas Coomans et Martin Drouin*, Le Patrimoine urbain 15 (Québec: Presses de l'Université du Québec, 2015), 11-110.

13 Dirk Pieter Blok, Walter Prevenier, and Daniel Jeen Roorda, *Algemene geschiedenis der Nederlanden,* vol. 9 – Nieuwe Tijd (Haarlem: Fibula-Van Dishoeck-1983, 1977).

14 Jean-Pierre Esther, Jan De Grauwe, and Vivian Desmet, *Het Kartuizerklooster binnen Brugge: verleden en toekomst.* (Brugge: Westvlaamse Gidsenkring, 1980).

15 Coomans, "L'ordre autour du cloître," 35-37.

16 Luc Devliegher, "Het Kartuizerklooster te Brugge voor zijn verbouwing tot kazerne," *Annales de la Société d'Émulation de Bruges* 130 (1993), 241-251. The plan is found in the Bruges municipal archive: SAB, Old Archive, 298.

17 Frank Simon, *Geschiedenis Der Kazernes Knapen En Rademakers Te Brugge* (Brugge: School voor Luchtdoelartillerie, n.d.).

18 Reinout Klaarenbeek and Thomas Coomans, "Reusing Urban Convents as State Schools in Belgian Towns (1773-1860)," *Revista de História Da Arte*, Série W (2017): 29-41.

19 Piet Lombaerde, *Antwerpen tijdens het Franse keizerrijk 1804-1814: marine-arsenaal, metropool en vestingstad* (Antwerpen: Simon Stevinstichting, 1989).

20 Mihail Benoît, *Le patrimoine militaire,* Bruxelles, ville d'art et d'histoire 50 (Brussels: Brussels Capital region), 2010.

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Bibliography

- Antoine, François. “La vente des biens nationaux à la fin du XVIIIe siècle, nouvelle donne pour la ville.” *Articulo* Special issue 1 (2009). Accesed April, 5, 2017, https://articulo.revues.org/1015, doi:10.4000/articulo.1015.
- Benoît, Mihail. *Le patrimoine militaire.* Bruxelles, ville d'art et d'histoire 50. Brussels: Brussels Capital region, 2010.
- Blok, Dirk Pieter, Walter Prevenier, and Daniel Jeen Roorda. *Algemene geschiedenis der Nederlanden.* Vol. 9, Nieuwe Tijd. Haarlem: Fibula-Van Dishoeck-1983, 1977.
- Bove, Boris, Hélène Noizet, and Laurent Costa, eds. *Paris, de Parcelles En Pixels. Analyse Géomatique de L’espace Parisien Médiéval et Modern*. Paris: Presses Universitaires de Vincennes et Comité d’Histoire de la Ville de Paris, 2013.
- Coomans, Thomas. “L’ordre autour du cloître: l’architecture des abbeys et des couvents, entre tradition, réformes et réaffectations.” In *Des couvents en héritage,* sous la direction de Luc Noppen, Thomas Coomans et Martin Drouin, 11-110. Le Patrimoine urbain 15. Québec: Presses de l’Université du Québec, 2015.
- Coomans, Thomas, and Reinout Klaarenbeek. “De Ruimtelijke Metamorfose van Steden Na de Secularisatie van de Kloosters in België Vanaf 1773 Tot 1860.” *Stadsgeschiedenis* 9/2 (2014): 149-165.
- Danckaert, Lisette. “Plan Détaillé de La Ville de Bruxelles Par Pierre Lefebvre d’Archambault.” *Cahiers Bruxellois* XIV (1969), 85-90.
- De Schepper, Gratianus. “Marie Thérèse et Joseph II: leur politique à l’égard des maisons réligieuses dans les Pays-Bas.” *Revue d’Histoire ecclésiasque* XXXV (1939): 509-529.
- Devliegher, Luc. “Het Kartuizerklooster te Brugge voor zijn verbouwing tot kazerne.” *Annales de la Société d’Émulation de Bruges* 130 (1993), 241-251.
- D’hondt, Jan, ed., *Huizenonderzoek & Stadsgeschiedenis. Handelingen van het Colloquium*. Leven in Oude Huizen, VII. Brugge: Levend Archief VZW, 2009.
- Esther, Jean-Pierre, Jan De Grauwe, and Vivian Desmet. *Het Kartuizerklooster binnen Brugge: verleden en toekomst.* Brugge: Westvlaamse Gidsenkring, 1980.
- Griffiths, Sam. “GIS and Research Into Historical ‘Spaces of Practice’: Overcoming the Epistemological Barriers.” In *History and GIS. Epistemologies, Considerations and Reflections*, edited by Alexander von Lünen, and Charles Travis, 153-171. Dordrecht: Springer, 2013.
- Hannes, Juul. “L’atlas cadastral parcellaire de la Belgique de P.-C. Popp: importance de cette source pour la géographie historique des communes.” *Bulletin trimestriel du Credit Communal de Belgique*; 85 (1968), 137-146 RUG Seminaries voor de geschiedenis, 1968.
- Janssens, Ellen, and Iason Jongepier. “GIStorical Antwerp: Historisch GIS Als Laboratorium Voor de Stadsgeschiedenis.” *Stadsgeschiedenis* 10/1 (2015): 49-62.
- Kain, Roger J. P., and Elizabeth Baigent. *The Cadastral Map in the Service of the State: A History of Property Mapping*. Chicago: University of Chicago press, 1992.
- Keyes, Garry, and Jens Toftgaard Jensen. “Mapping Urban History: GIS and the Analysis of the Urban Space of Nineteenth-Century Aarhus.” International Association for History and Computing XVth Conference in Tromso, 2003. http://www.rhd.uit.no/ahc/paper/jtj_gk_mapping_urban_history.pdf.
- Klaarenbeek, Reinout, and Thomas Coomans. “Reusing Urban Convents as State Schools in Belgian Towns (1773-1860).” *Revista de História Da Arte. Serie W* (2017): 29-41.
- Knowles, Anne Kelly, and Amy Hillier, eds. *Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship*. Redlands, Calif.: ESRI Press, 2008.
- Lombaerde, Piet. *Antwerpen tijdens het Franse keizerrijk 1804-1814: marine-arsenaal, metropool en vestingstad*. Antwerpen: Simon Stevinstichting, 1989.

- Pinho, Paulo, and Vitor Oliveira. "Cartographic Analysis in Urban Morphology." *Environment and Planning B: Planning and Design* 36/1 (2009): 107-127, doi: 10.1068/b34035.
- Ronsijn, Wouter. *De kadasterkaarten van Popp, een sleutel tot uw lokale geschiedenis: historische geografie van Aarschot, Asse, Halle en Tienen aan de hand van de kadasterkaarten van Popp*. Accenten uit de geschiedenis van Vlaams-Brabant. Leuven: Peeters, 2007.
- Segers, Yves. "Een Omstreden Verbruiksbelasting: De Stedelijke Octrooien in Belgie (1799-1860)." *Belgisch Tijdschrift Voor Nieuwste Geschiedenis* 30/3-4 (2000): 325-369.
- Simon, Frank. *Geschiedenis Der Kazernes Knapen En Rademakers Te Brugge*. Brugge: School voor Luchtdoelartillerie, n.d.
- Verhelst, Juul. *De documenten uit de ontstaansperiode van het moderne kadaster en van de grondbelasting 1790-1835, Door J. Verhelst*. Miscellanea archivistica 31. Brussel: Algemeen rijksarchief, 1982.
- Zoete, Antoine. *De documenten in omloop bij het Belgisch kadaster 1835-1975*. Miscellanea Archivistica 21. Brussel: Algemeen rijksarchief, 1979.

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